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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,169

06/09/2005

Takeaki Sasaki

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EXAMINER

BELL, BRUCE F

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,169	<b>Applicant(s)</b> SASAKI ET AL.	
	<b>Examiner</b> Bruce F. Bell	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-24 and 26-36 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-24 and 26-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 9, 22, 26 and 27 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 9 and 22 do not further limit the electrode catalyst per se, it only sets forth its use in a particular application of brine electrolysis. Therefore, the electrode catalyst has not been further limited to narrow its scope. How a material is used, does not narrow the scope of the catalyst itself, therefore, applicant should further limit the catalyst or cancel the claim.

Claims 26 and 27 depend on claim 22 and therefore have the same deficiency.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 1, 3, 5-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al (2005/0201919).

Yu et al disclose a cathode for a solid oxide fuel cell having a cathode material of  $\text{Ln}_{1-x}\text{A}_x\text{Cu}_{1-y}\text{B}_y\text{O}_{2.5\pm\delta}$  wherein Ln is a lanthanide group material, A is an alkaline-earth metal and B is a metal. See abstract. Fuel cells typically have either a supported electrolyte or a supported electrode structure. See paragraph 0007 and 0008. The cathode is able to accelerate absorption of oxygen molecule and diffusion of oxygen ion that means to reduce overpotential of the cathode and to increase efficiency of the power generation of the fuel cell (i.e. gas diffusion cathode). Lanthanides that may be used are those of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu. Alkaline earth metals that may be used are those of Be, Mg, Ca, Sr, Ba and Ra. Metals that may be used are those of Pd, Pt, Ru, and Rh.

The prior art of Yu et al anticipates the applicants instant claims as shown by way of the disclosure above, which shows that a conductive carrier (anode or

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cathode) having a catalyst of a lanthanide, alkaline-earth metal and a platinum group metal is disclosed. Further the formula sets forth the molar ratios as set forth in applicants instant claims. Therefore, the prior art of Yu et al anticipates the applicants instant invention as presently claimed. The rejection of the claims is proper until such time as applicant submits a certified English translation of the priority document.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 5-11, 16-21, 23, 30, 33 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Hagemeyer et al (2004/0184986).

Hagemeyer et al disclose a catalyst having platinum or its oxide or mixtures thereof and at least one of Mg, Ca, Sr, Ba or mixtures thereof, and at least one of Sc, Y, Ir, Pd, La, Ce, Pr, Nd, Sm, Eu and oxides and mixtures

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thereof. The catalyst may be supported on a carrier. See abstract. The presence of the alkali or alkaline earth metal within the catalyst is believed to be used to adsorb and activate water in the reaction. See paragraph 0085. The support or carrier may be any support or carrier used with the catalyst which is porous, adsorptive, and has high surface area support with a surface area of about 25 to 500 m<sup>2</sup>/gm. The porous carrier material may be relatively inert to the conditions utilized and may include carrier materials that have traditionally been utilized such as activated carbon, coke or charcoal. See paragraph 0096. When supports are used, the amount of catalyst component in the support, typically may be far in excess of the amount of the catalyst component needed for the catalyst. Thus the support may act as both an active catalyst component and a support material for the catalyst. See paragraph 0097.

The prior art of Hagemeyer et al anticipates the applicants instant invention as shown by way of the disclosure to Hagemeyer et al above. The electrode catalyst is shown to be supported and that the support can be a carbon, charcoal or coke and that the catalyst is a mixture of Pt, an alkaline earth metal and a lanthanide as set forth in the instant claims as presented. The carrier is shown to be porous and therefore is a gas diffusion electrode. Therefore, the prior art of Hagemeyer et al anticipates the applicants instant invention as set forth in the instant claims. The rejection will stand until such time as a certified English translation of the priority document has been received, showing that the invention was in fact patented with such subject matter as is now instantly claimed.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-12, 14-24, 26—6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nara et al (6312571) in combination with Hagemeyer et al (2004/0184986) and Zhitomir (6528201).

Nara et al disclose an activated cathode having an electrically conductive substrate, an interlayer of nickel oxide formed on the surface thereof, and a catalyst layer having at least one lanthanum component selected from oxides and hydroxides thereof and at least one platinum component selected from platinum and silver and oxides and hydroxides thereof formed on the interlayer. See abstract. The activated cathode is used in the electrolysis of brine. See col. 1, lines 5-9. The electrically conductive substrate is one of stainless steel, titanium, nickel or carbon materials which yield electrical conductivity and chemical stability. See col. 3, lines 24-26. The platinum metals that may be used are those of platinum, palladium, ruthenium, iridium and silver. The mixing ratio of the platinum group metal to lanthanum metal is from 40:60 to 80:20 mol %. See col. 4, lines 53-61. The cathode is used in the electrolysis of brine along with an ion exchange membrane and anode and the anode and cathode are known as being dimensionally stable.

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The prior art of Nara et al does not disclose the use of an alkaline earth metal in the catalyst composition.

The prior art of Hagemeyer et al is as disclosed above in the 35 USC 102 rejection. Hagemeyer et al is used to show that the alkaline earth metal used in the catalyst composition is used to adsorb and activate water in the reaction.

The prior art of Hitomi is used to show that carbon particles support catalyst metal compositions due to the high catalytic activity for the reduction of oxygen and the oxidation reaction hydrogen. The carbon particles are typically combined with PTFE to form an electrically conductive porous carbon electrode substrate to which the catalyst is attached. See col. 1, line 29 – col. 2, line 2.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Nara et al does not disclose the use of an alkaline earth metal in the catalyst composition, the prior art of Hagemeyer et al shows that the addition of an alkaline earth metal is done to adsorb and activate water in the reaction which is one of the same reasons why one would use this metal in the prior art of Nara et al to increase the efficiency of the brine electrolysis cell since brine is used and is electrolyzed to separate out the components being produced and therefore water removal would be an important aspect of brine electrolysis. Further, Hitomi et al is cited to show how a carbon support is made by utilizing carbon particles along with PTFE to make an electrically conductive porous support on which a catalyst is supported that will yield high catalytic activity for the reduction reaction of oxygen and the oxidation reaction of hydrogen which is



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also necessitated in brine electrolysis reactions. The use of current collectors in brine electrolysis is known and is seen by the use of nickel mesh as shown in the examples of Nara et al and is done to give better electrical connections to the electrodes of a gas diffusion electrode. Therefore, the prior art of Nara et al in combination with Hagemeyer et al and Hitomi renders the applicants instant claims obvious for the reasons set forth above.

### ***Response to Arguments***

11. Applicant's arguments with respect to claims 11, 29 and 31 have been considered but are moot in view of the new ground(s) of rejection.

The rejection of claims 11, 29 and 31 have been dropped in view of the new rejection under 35 USC 103 wherein the examiner shows the catalyst including the alkaline earth metal, platinum group metal and lanthanum metals and there oxides being used and why the alkaline earth metal is used and why a carbon particle support would be used as shown by the disclosures to Nara et al in combination with Hagemeyer et al and Hitomi as discussed above.

The rejection of claims 11, 30 and 32-34 over Nara et al and separately over Nishiki has been dropped in view of the new rejection under 35 USC 102 (e) over Hagemeyer et al and also in view of the new rejection under 35 USC 103 over Nara et al in combination with Hagemeyer et al and Hitomi. Applicant has now changed the instant claim to recite that the conductive carrier is carbon powder and Hagemeyer et al and Hitomi both show that carbon powder catalyst carriers are known for their high catalytic activity. Therefore, the rejection under

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35 USC 103 as shown above addresses the conductive carrier being of carbon powder.

The examiners allowance of claims in the previous office action has been dropped in view of newly cited art that the examiner found in the researching of the newly added limitations in the rejected claims in the previous final office action. The examiner would like to apologize for any inconvenience that applicants may incur as a result of this finding.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BFB  
May 7, 2008

/Bruce F. Bell/  
Primary Examiner, Art Unit 1795